

# LAB GUIDE

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## Lab: App Modernization

### Pre-requisites

- Microsoft Azure Account: You'll need a valid and active Azure account for the Azure labs.

### Length

30 minutes

## Exercise 1: Migrate the database to Azure SQL Database

### Task 1: Provision a SQL Server

In this task, you will create a SQL Server (logical server). You will not create the databases at this time since it will be created during the database migration step

1. In a web browser, navigate to the Azure portal <http://portal.azure.com> and sign in with the credentials provided.
2. Select "+Create a resource", enter SQL Server into the Search the Marketplace box, press enter and select SQL Server (logical server) from the results.

Everything ✦ □ ⋮
















✕

Pricing  
All ▾

Operating System  
All ▾

Publisher  
All ▾

Results

NAME	PUBLISHER	CATEGORY
 SQL Server 2016 SP1 Enterprise on Windows Server 2016	Microsoft	Compute
 SQL server (logical server)	Microsoft	Databases
 SQL Server Module	Microsoft	Databases
 ScaleArc for SQL Server	ScaleArc	Compute
 SQL Server AlwaysOn Cluster	Microsoft	Compute
 MS SQL Server Integration Services to Alation	Information Asset	Storage
 DgSecure for SQL Server	Dataguise	Compute
 SQL Server 2016 SP2 Std w/ VulnerabilityAssessment	Cognosys Inc.	Compute
 Free SQL Server License: SQL Server 2019 Developer on Red Hat Enterprise Linux 7.4	Microsoft	Databases
 ScaleArc for SQL Server (pay-go)	ScaleArc	Compute
 SQL Server 2014 SP3 Enterprise on Windows Server 2012 R2	Microsoft	Databases
 SQL Server 2017 Ent w/ Vulnerability Assessment	Cognosys Inc.	Compute
 SQL Server 2014 SP3 Standard on Windows Server 2012 R2	Microsoft	Databases
 SQL Server 2017 Web with Vulnerability Assessment	Cognosys Inc.	Compute
 SQL Server 2016 SP1 Ent w/ VulnerabilityAssessment	Cognosys Inc.	Compute

3. Select Create on the SQL server (logical server) blade

4. On the SQL Server (logical server on...) blade, specify the following configuration:

- a. Server name: Enter a unique value, such as SQLTESTXXX Where you must change the values for XXX, (ensure the green checkmark appears).
- b. Server admin login: demouser
- c. Password: Password.1!!
- d. Resource group: Select the module-01-XXXXX resource group, Where XXXXX is the number assigned to your credentials.
- e. Location: Select the nearest location to where you are.

Home > New > Marketplace > Everything > SQL server (logical server) > SQL Server (logical server only)

SQL Server (logical server ...)

\* Server name  
sqltest777 ✓  
.database.windows.net

\* Server admin login  
Enter user name

\* Password

\* Confirm password

\* Subscription  
Pase para Azure: patrocinio

\* Resource group  
Select existing...  
Create new

\* Location  
East US

☒ Allow Azure services to access server ⓘ

Advanced Data Security ⓘ  
Start FREE Trial Not now

FREE trial period of 30 days, and then 289.5 MXN/server/month.  
[Learn more](#)

5. Select Create.

## Task 2: Configure SQL Server firewall

In this task, you will create a firewall rule to allow access to your SQL Server

1. After the SQL Server finishes provisioning, navigate to it by select Resource groups from the left-hand menu in the Azure portal, then click on module-01-XXXXX resource group from the list.

Home > Resource groups

Resource groups  
MS Azure Labs

+ Add Edit columns Refresh Assign tags Export to CSV

Subscriptions: Azure Labs G-06

Filter by name... All locations All tags

4 items

<input type="checkbox"/>	NAME	SUBSCRIPTION	LOCATION
<input checked="" type="checkbox"/>	module-01-55401	Azure Labs G-06	West US
<input type="checkbox"/>	module-02-55401	Azure Labs G-06	West US
<input type="checkbox"/>	module-03-55401	Azure Labs G-06	West US
<input type="checkbox"/>	module-04-55401	Azure Labs G-06	West US

## 2. Select your SQL Server from the resources in the group.

The screenshot shows the Azure portal interface for the resource group 'module-01-55401'. The left sidebar contains navigation options like Overview, Activity log, Access control (IAM), Tags, Events, Settings, Quickstart, Resource costs, Deployments, Policies, Properties, Locks, Automation script, Monitoring, Insights (preview), and Alerts. The main area displays the 'Overview' tab with a list of resources. The 'sqltest888' SQL server is highlighted with a red box.


NAME	TYPE	LOCATION
MyLabModule1-vnet	Virtual network	West US
MySQLVM	Virtual machine	West US
MySQLVM_disk2_cf587af7659c44f2854b43c070461867	Disk	West US
MySQLVM_OsDisk_1_70547670138c49b08db38605a88c11df	Disk	West US
MySQLVM-ip	Public IP address	West US
mysqlvmnic	Network interface	West US
MySQLVM-nsg	Network security group	West US
sqltest888	SQL server	East US


## 3. On the SQL Server blade, select Firewalls and virtual networks under Settings.


The screenshot shows the Azure portal interface for the 'sqltest888' SQL server. The left sidebar contains navigation options like Diagnose and solve problems, Settings, Quick start, Failover groups, Manage Backups, Active Directory admin, SQL databases, SQL elastic pools, Deleted databases, Import/Export history, DTU quota, Properties, Locks, Automation script, Security, Advanced Data Security, Auditing, Firewalls and virtual networks, Transparent data encryption, Intelligent Performance, Automatic tuning, and Recommendations. The main area displays the 'Settings' tab with a list of settings. The 'Firewalls and virtual networks' option is highlighted with a red box.


NAME	TYPE	STATUS	PRICING TIER
No resources found.			

## 4. On the Firewalls and virtual networks blade, specify a new rule named ALL, with START IP 0.0.0.0, and END IP 255.255.255.255, then select Save

 Save

 Discard

 Add client IP



Connections from the IPs specified below provides access to all the databases in sqltest777.

Allow access to Azure services


ON

OFF

Client IP address

177.228.15.240

RULE NAME	START IP	END IP
All ✓	0.0.0.0 ✓	255.255.255.255 ✓ ...



Connections from the VNET/Subnet specified below provides access to all databases in sqltest777.

Virtual networks

[+ Add existing virtual network](#)

[+ Create new virtual network](#)

RULE NAME	VIRTUAL NETW...	SUBNET	ADDRESS RAN...	ENDPOINT STA...	RESOURCE GROUP	SUBSCRIPTION	STATE
No vnet rules for this server.							

5. On the Success dialog box, select OK

### Task 3: Migrate the on-premises SQL database to Azure

In this task, you are going to create the AdventureTest database and migrate it from on-premises (Lab VM) into Azure SQL Database

- 1. On Azure Portal, From the Left menu, go to Virtual Machines.

**Microsoft Azure** Search resources, services, and docs

«

**Virtual machines** [See all \(+100\)](#) >

Virtual machines Storage accounts App Services SQL databases Azure Database for PostgreSQL

Kubernetes services Function Apps Azure Databricks Cognitive Services

**Make the most out of Azure**

**Learn** Azure with free online courses by Microsoft  
[Microsoft Learn](#)

**Monitor** your apps and infrastructure  
[Azure Monitor](#) >

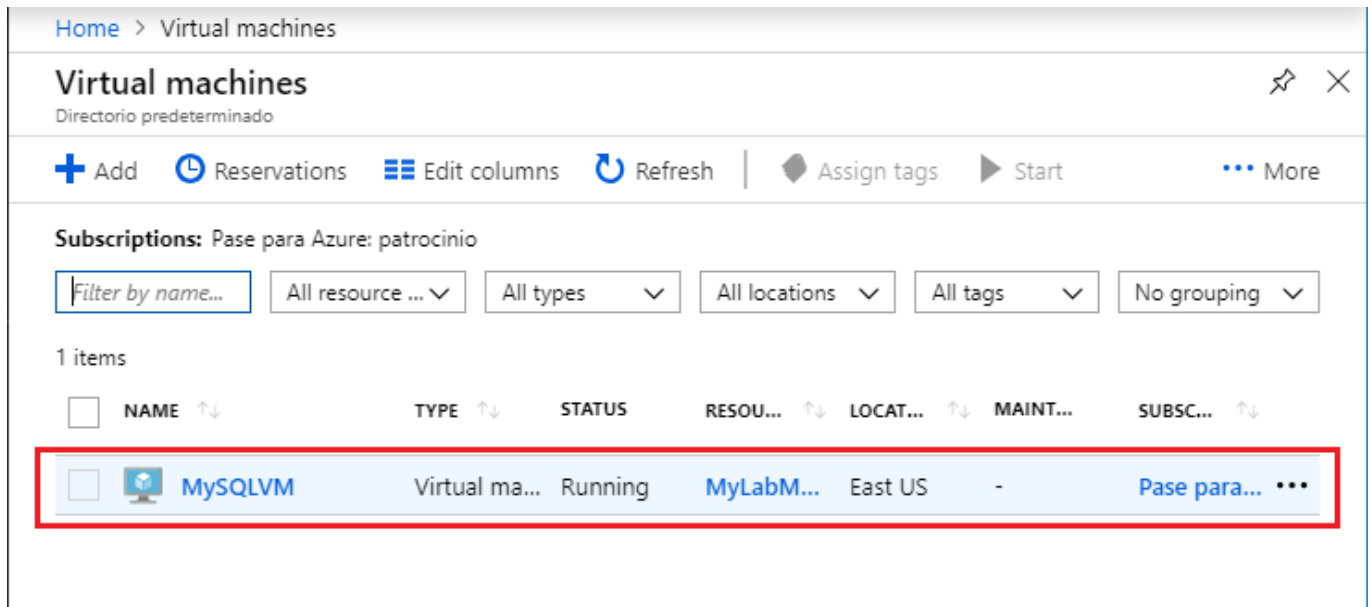
**Secure** your resources  
[Security Center](#) >

**Optimize** performance, reliability, security, and costs  
[Azure Advisor](#) >

**Connect** to Azure via an authenticated browser-based shell  
[Cloud Shell](#) >

**Recent resources** [See all your recent resources](#) > [See all your resources](#) >

3. Click on MySQLVM



Home > Virtual machines

## Virtual machines


Directorio predeterminado

+ Add ⌚ Reservations ≡ Edit columns ↺ Refresh | ⬢ Assign tags ▶ Start ... More

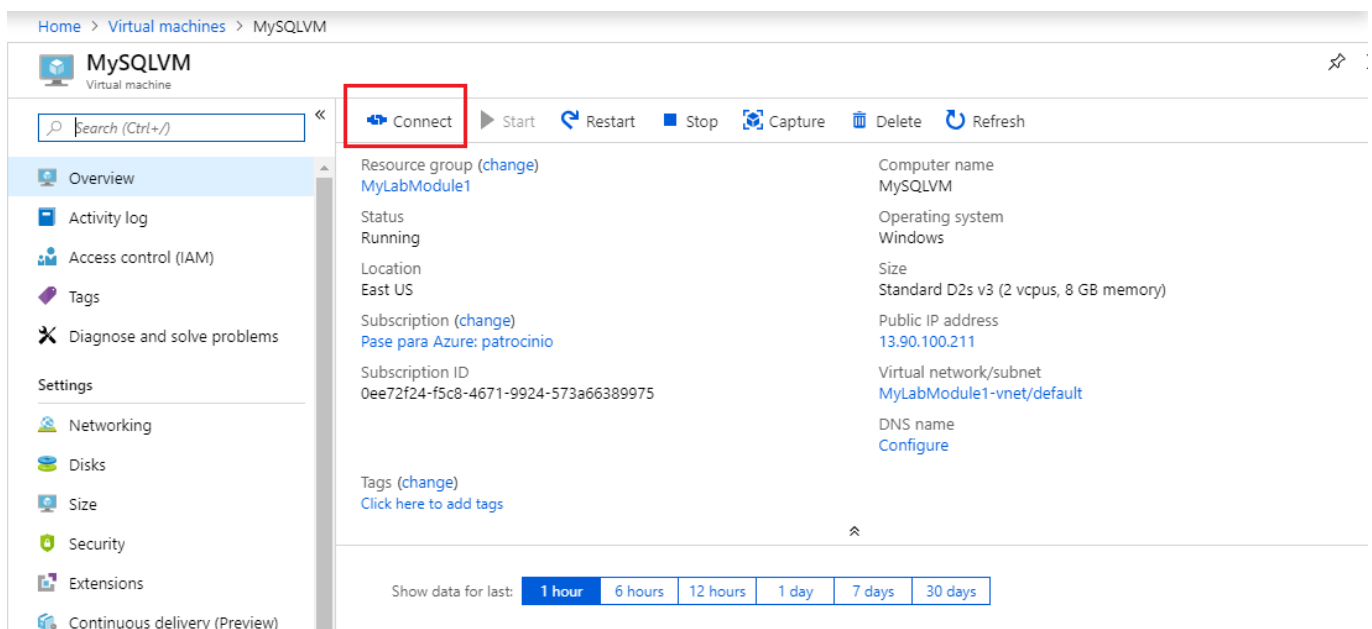
**Subscriptions:** Pase para Azure: patrocinio

Filter by name... All resource ... All types All locations All tags No grouping

1 items

<input type="checkbox"/>	NAME ↑↓	TYPE ↑↓	STATUS	RESOU... ↑↓	LOCAT... ↑↓	MAINT...	SUBSC... ↑↓
<input type="checkbox"/>	 MySQLVM	Virtual ma...	Running	MyLabM...	East US	-	Pase para... ⋮

4. On the VM's Dashboard, click on Connect from the upper menu.



Home > Virtual machines > MySQLVM

## MySQLVM

Virtual machine

Search (Ctrl+/) « **Connect** ▶ Start ↺ Restart ■ Stop 📷 Capture 🗑 Delete ↺ Refresh

**Overview**

- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

**Settings**

- Networking
- Disks
- Size
- Security
- Extensions
- Continuous delivery (Preview)

Resource group (change) [MyLabModule1](#)

Status [Running](#)

Location [East US](#)

Subscription (change) [Pase para Azure: patrocinio](#)

Subscription ID [0ee72f24-f5c8-4671-9924-573a66389975](#)

Tags (change) [Click here to add tags](#)

Computer name [MySQLVM](#)

Operating system [Windows](#)

Size [Standard D2s v3 \(2 vcpus, 8 GB memory\)](#)

Public IP address [13.90.100.211](#)

Virtual network/subnet [MyLabModule1-vnet/default](#)


DNS name [Configure](#)

Show data for last: **1 hour** 6 hours 12 hours 1 day 7 days 30 days

5. Click on Download RDP File.

## Connect to virtual machine

MySQLVM

 To improve security, enable just-in-time access on this VM. →

RDP

SSH

To connect to your virtual machine via RDP, select an IP address, optionally change the port number, and download the RDP file.


\* IP address


Public IP address (13.90.100.211) ▼

\* Port number

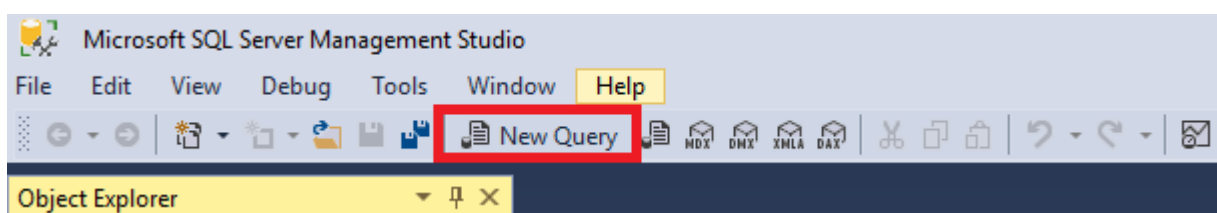
3389

Download RDP File

 Inbound traffic to the Public IP address may be blocked. You can update inbound port rules in the **VM Networking** page.

 You can troubleshoot VM connection issues by opening the **Diagnose and solve problems** page.

- Go to your downloads folder and double click on MySQLVM.rdp File, click on Connect, enter student as the username and Pa55.wrd1234 as Password, and click on Accept. Then click on Yes.
- Click on Start Button and type Management, from the results click on SQL Management Studio 17, and then click connect.
- Click on New Query



- Type the following code and click on Execute

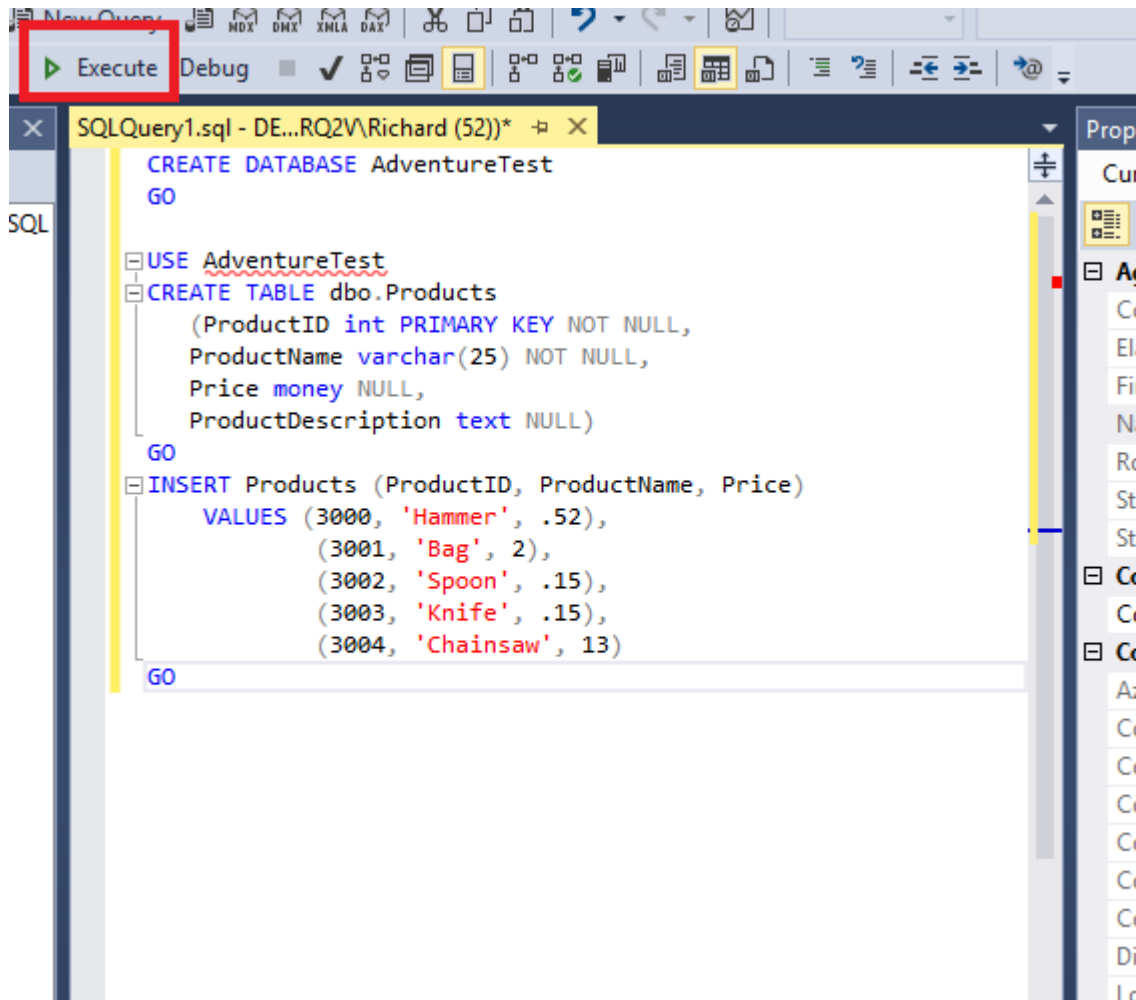
```
CREATE DATABASE AdventureTest
GO

USE AdventureTest
CREATE TABLE dbo.Products
(
    ProductID int PRIMARY KEY NOT NULL,
    ProductName varchar(25) NOT NULL,
    Price money NULL,
    ProductDescription text NULL
)
GO
```

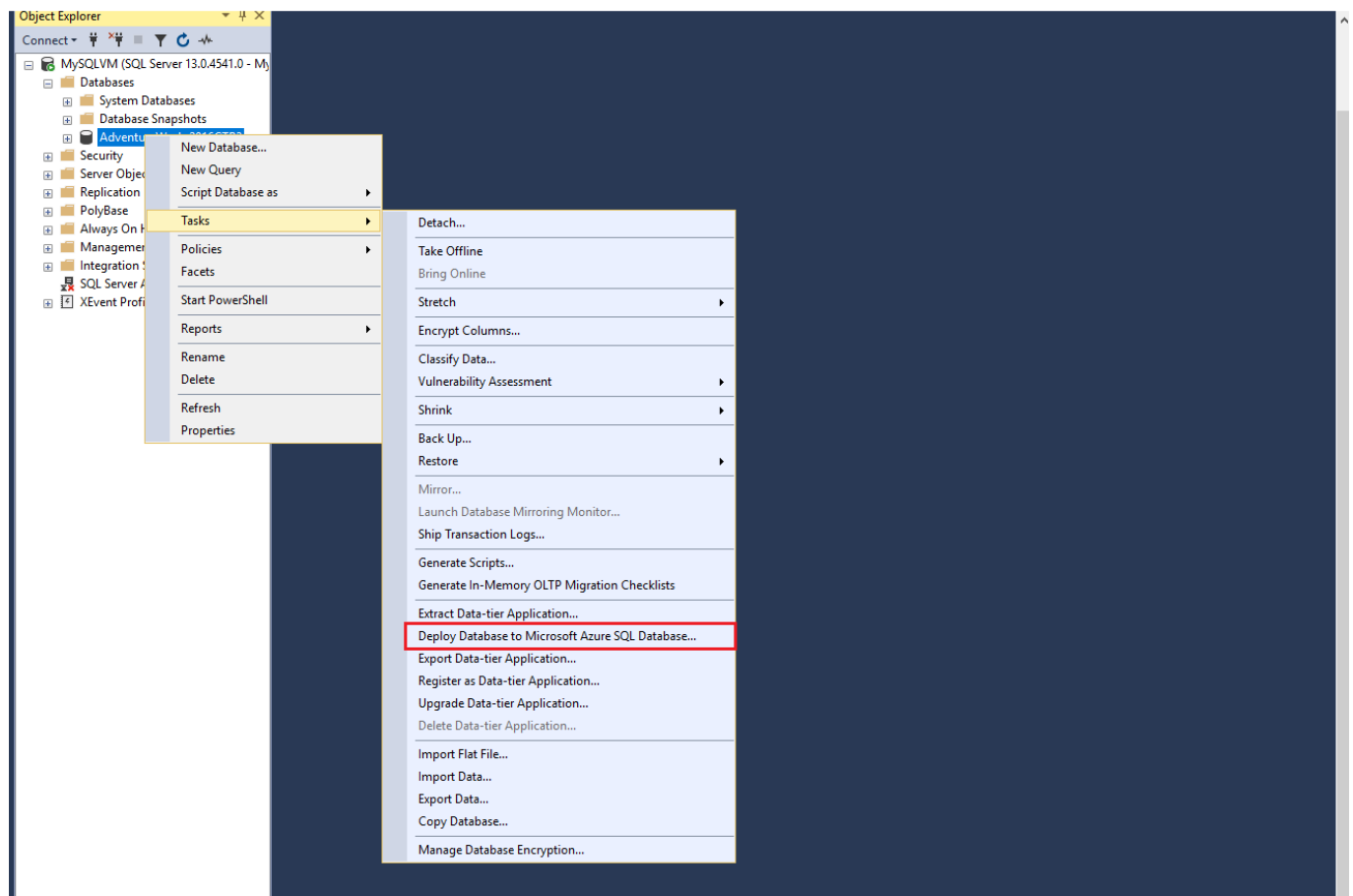


```
INSERT Products (ProductID, ProductName, Price)
VALUES (3000, 'Hammer', .52),
       (3001, 'Bag', 2),
       (3002, 'Spoon', .15),
       (3003, 'Knife', .15),
       (3004, 'Chainsaw', 13)

GO
```



10. At object explorer, expand Databases and click on refresh until the AdventureTest Database appears
11. Right-click the AdventureTest database, select Tasks and then Deploy Database to Microsoft Azure SQL Database.



12. In the Deploy Database 'AdventureTest' dialog, select Next to begin.

13. On the Deployment Settings tab, select Connect next to Server Connection.

Deploy Database 'AdventureWorks2016CTP3'

## Deployment Settings

Introduction  
Deployment Settings  
Summary  
Results

Help

### Specify Target Connection

Specify the name of the instance of SQL Server or the Microsoft Azure SQL Database server that will host the deployed database, name the new database, and then click Connect to login to the target server.

Server connection:

Connect...

New database name:

AdventureWorks2016CTP3

#### Microsoft Azure SQL Database settings

Edition of Microsoft Azure SQL Database:

Maximum database size (GB):

Service Objective:

#### Other settings

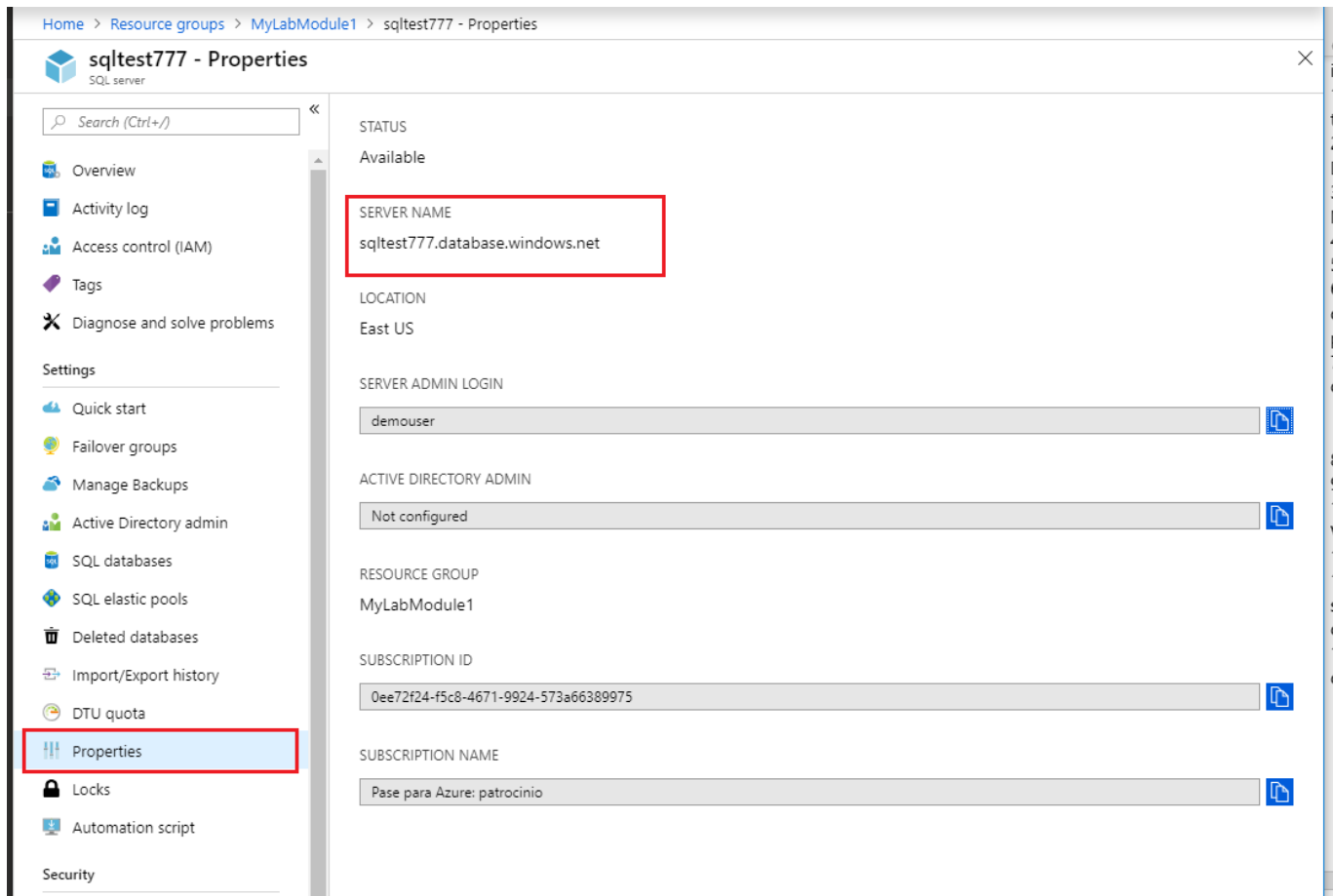
Temporary file name:

C:\Users\student\AppData\Local\Temp\2\AdventureWorks2016CTP3-20190214185926.ba

Browse...

< Previous   Next >   Cancel

14. In the Connect to Server dialog, enter the server name of the Azure SQL server you created previously. You can find this by navigating to your SQL Server in the Azure portal and selecting Properties.

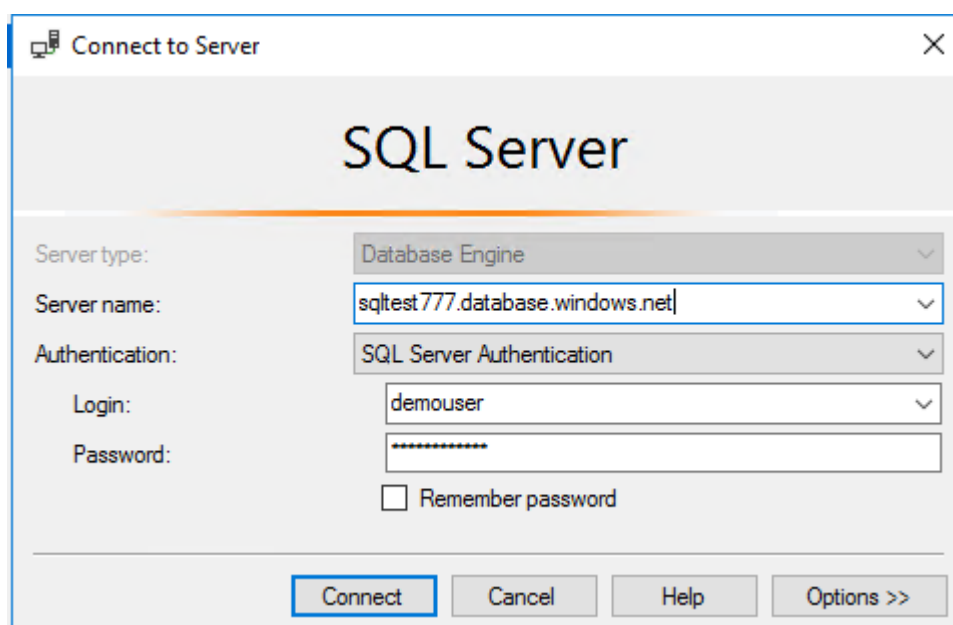


15. Next, set Authentication to SQL Server Authentication and enter the following credentials:

- a. Login: demouser
- b. Password: Password.1!!

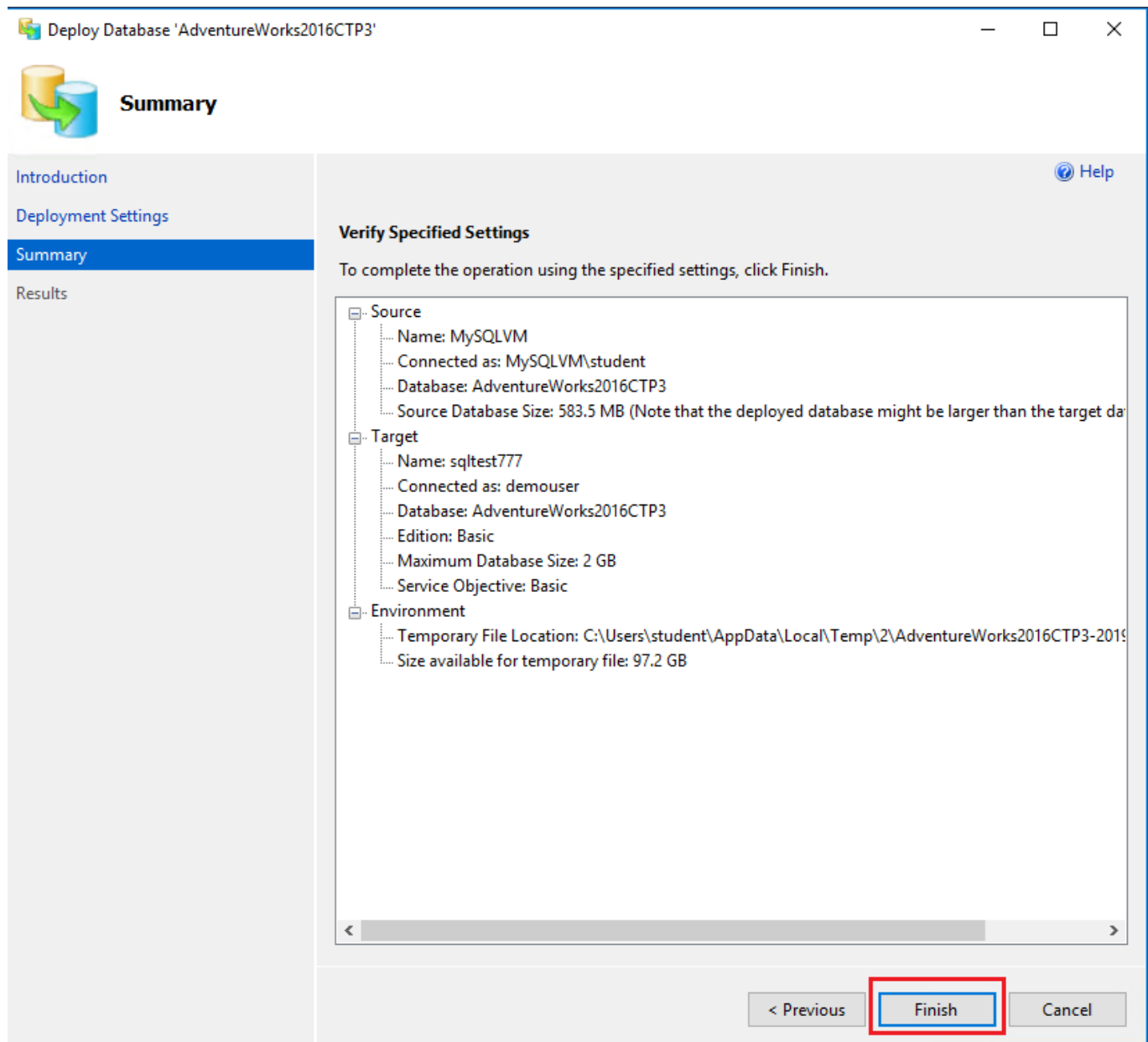
16. Check Remember password.

17. Select Connect.



18. You should now see the Azure SQL server name in the Server connection box. Verify the new database name is AdventureTest, then, select Next.

19. Verify the settings are correct and select Finish.



20. When the operation has completed, close the database deployment dialog. You should see green checkmarks next to each completed step, along with a large checkmark next to Operation Complete.

21. You can verify that the database is operational, and its tables populated by connecting to it through SSMS (SQL Server Management Studio), using the same credentials used in Step 15 above.

## Exercise 2: Provision App Services

### Task 1: Create a Web App

In this task, you will provision a Web App and API App in Azure.

1. In the Azure portal <http://portal.azure.com>, create a new Web App by selecting +Create a resource, type "web app" in the Marketplace search box, hit enter, and select the Web App item in the results.








Home > New > Marketplace > Everything

## Everything

web app

Pricing: All Operating System: All Publisher: All

Results

NAME	PUBLISHER	CATEGORY
 Web App	Microsoft	
 Web App Bot	Microsoft	
 Web App + SQL	Microsoft	Web
 HTML5 Empty Web App	Microsoft	Web
 ASP.NET Empty Web App	Microsoft	Web
 Express Web App	Microsoft	Web
 Web App + PostgreSQL	Microsoft	Web

2. Select Create on the Web App blade.

3. On the Web App Create blade, specify the following configuration:

- a. Subscription: Select the subscription you are using for this lab.
- b. Resource group: Select Use existing and select the resource group provided for this Module 1 lab.
- c. Name: Enter a unique and valid URL, such as myfirstappXXX Where you must change the values for XXX (until the green check mark appears) in the App Name field.
- d. Publish: Select Code.
- e. Runtime stack: Select ASP.NET V4.7.
- f. Operating System: Windows will be selected because of the runtime stack you selected.
- g. Region: Choose the nearest region to where you are doing this lab.

Home > New > Marketplace > Web App > Web App

## Web App

Create


---


\* Basics   Monitoring   Tags   Review and create

App Service Web Apps lets you quickly build, deploy, and scale enterprise-grade web, mobile, and API apps running on any platform. Meet rigorous performance, scalability, security and compliance requirements while using a fully managed platform to perform infrastructure maintenance. [Learn more](#)


### PROJECT DETAILS

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

\* Subscription 

\* Resource Group   [Create new](#)

### INSTANCE DETAILS

\* Name   .azurewebsites.net

\* Publish

\* Runtime stack


\* Operating System

\* Region

- h. Plan: Leave the default setting, note that if you dont have an App Service Plan it will be created
- i. Sku and size: Ensure that Standard S1 is selected

### APP SERVICE PLAN


App Service plan pricing tier determines the location, features, cost and compute resources associated with your app. [Learn more](#)

\* Plan (Central US)   [Create new](#)

\* Sku and size    
 100 total ACU, 1.75 GB memory   
 [Change size](#)


4. You can click on Change size under Sku and size and review the details of every size offered, after that, click on the Production tier, select S1 and then click on Apply

## Spec Picker




### Dev / Test

For less demanding workloads



### Production

For most production workloads



### Isolated

Advanced networking and scale

### Recommended pricing tiers

**S1**

- 100 total ACU
- 1.75 GB memory
- A-Series compute equivalent
- 1435.92 MXN/Month (Estimated)

**P1V2**

- 210 total ACU
- 3.5 GB memory
- Dv2-Series compute equivalent
- 2871.84 MXN/Month (Estimated)

**P2V2**

- 420 total ACU
- 7 GB memory
- Dv2-Series compute equivalent
- 5743.68 MXN/Month (Estimated)


**P3V2**

- 840 total ACU
- 14 GB memory
- Dv2-Series compute equivalent
- 11487.36 MXN/Month (Estimated)


[See additional options](#)

#### Included features


Every app hosted on this App Service plan will have access to these features:

**Custom domains / SSL**


Configure and purchase custom domains with SNI and IP SSL bindings

**Auto scale**


Up to 10 instances. Subject to availability.

**Staging slots**

Up to 5 staging slots to use for testing and deployments before swapping them into production.

**Daily backups**


Backup your app 10 times daily.

**Traffic manager**


Improve performance and availability by routing traffic between multiple instances of your app.

#### Included hardware


Every instance of your App Service plan will include the following hardware configuration:

**Azure Compute Units (ACU)**

Dedicated compute resources used to run applications deployed in the App Service Plan. [Learn more](#)

**Memory**

Memory per instance available to run applications deployed and running in the App Service plan.

**Storage**

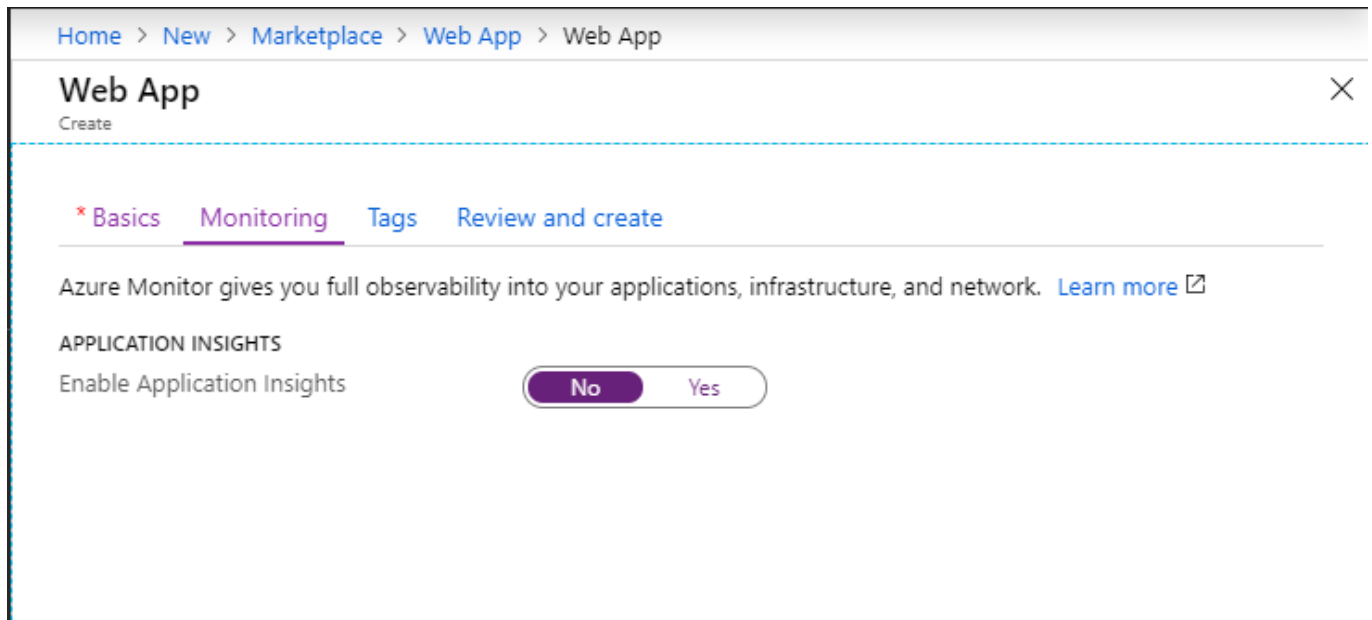
50 GB disk storage shared by all apps deployed in the App Service plan.

Apply

- Click on Next: Monitoring at the bottom of the page.
- Disable the Application Insights

16 / 23





7. Select Review and create at the bottom of the page, and then click on Create

## Exercise 3: Connect your App with the Azure SQL Database

### Task 1: Get the connection String

1. On the azure portal, from the left menu, click on SQL databases
2. Select the AdventureTest Database you just migrated.
3. From the AdventureTest blade, click on Connection strings

Home > [SQL databases](#) > AdventureTest (sqltest777/AdventureTest)

## AdventureTest (sqltest777/AdventureTest)

SQL database

Search (Ctrl+ /)

Copy Restore Export Set server firewall Delete

Resource group ([change](#)) **module1** Server name **sqltest777.database.windows**

Status **Online** Elastic pool **No elastic pool**

Location **East US** Connection strings [Show database connection](#)

Subscription ([change](#)) **Pase para Azure: patrocinio** Pricing tier **Basic**

Subscription ID **ff568b9a-9356-43fa-ac3b-4d7e17379ef8** Oldest restore point **2019-03-07 01:10 UTC**

Tags ([change](#)) [Click here to add tags](#)

### Resource utilization (AdventureTest)

1 hour 24 hours 7 days View: Max

100% 90% 80% 70% 60% 50% 40% 30% 20% 10%

4. Select the ADO.NET connections string and click on the copy button, note that you will need to change the information with your username and password

### AdventureTest (sqltest777/AdventureTest) - Connection strings

ADO.NET JDBC ODBC PHP

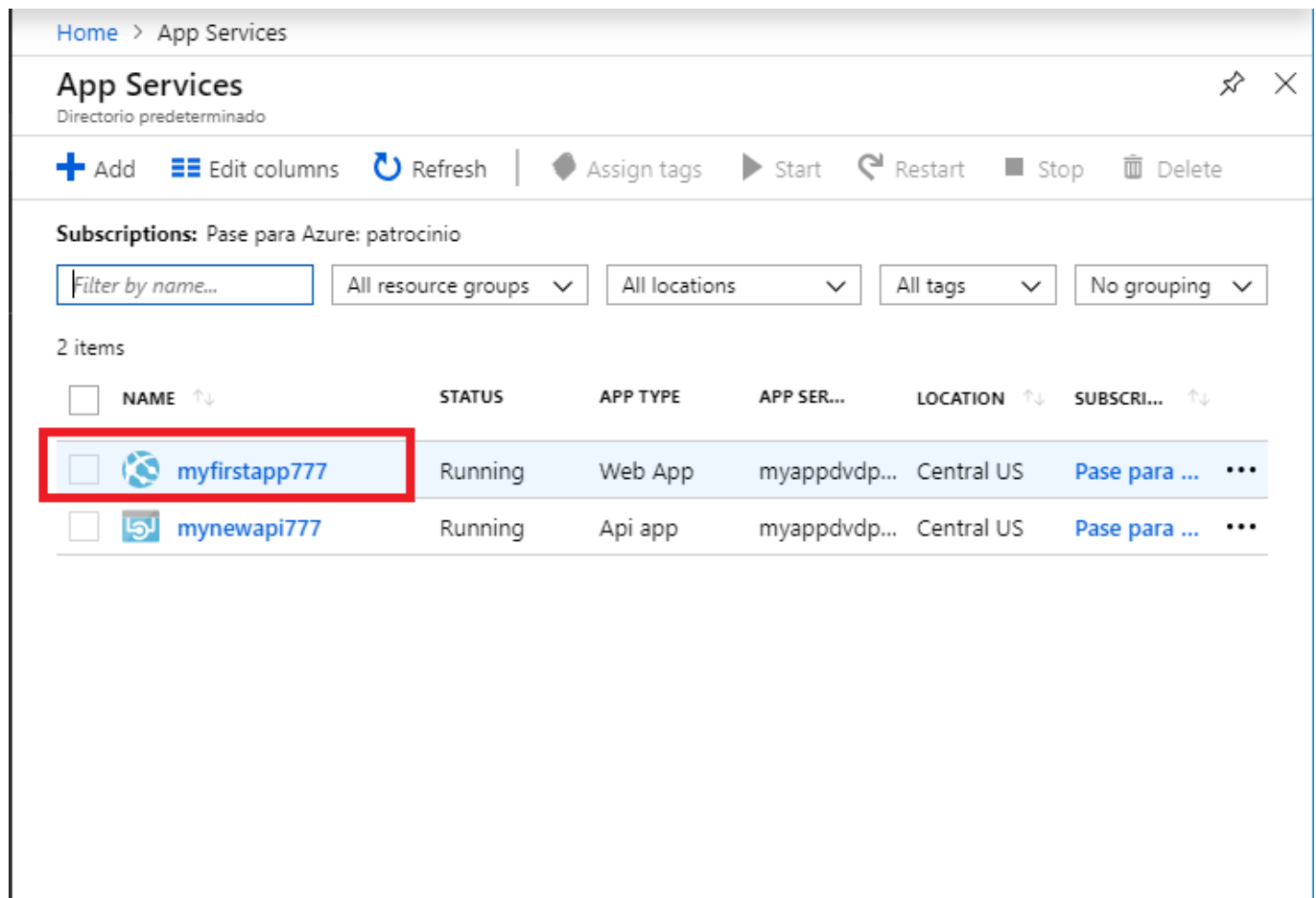
ADO.NET (SQL authentication)

Server=tcp:sqltest777.database.windows.net,1433;Initial Catalog=AdventureTest;Persist Security Info=False;User ID=(your\_username);Password=(your\_password);MultipleActiveResultSets=False;Encrypt=True;TrustServerCertificate=False;Connection Timeout=30;



[Download ADO.NET driver for SQL server](#)

## Task 2: Add the connection string to your Web App

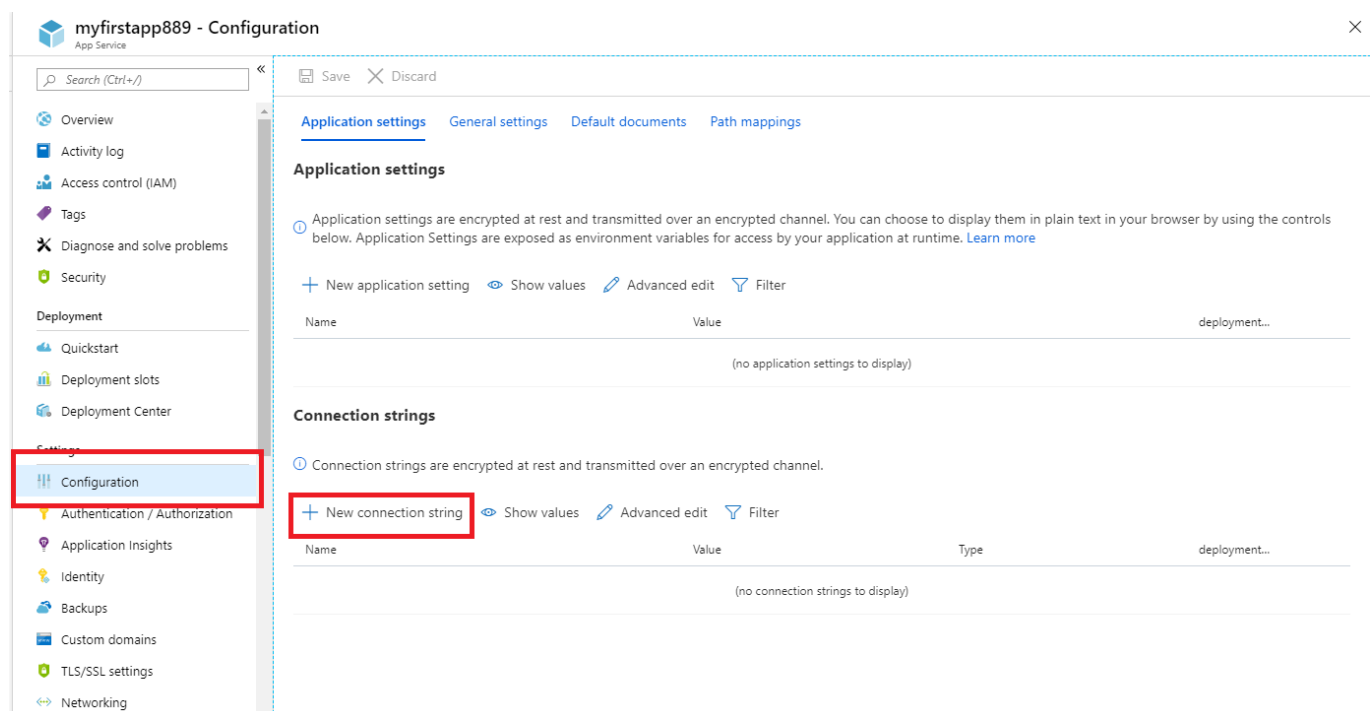
1. On the Azure Portal from the left menu, click on App Services, and then click on the App you just created on Exercise 2



The screenshot shows the Azure App Services blade. The top navigation bar includes 'Home > App Services'. Below the header, there are buttons for 'Add', 'Edit columns', 'Refresh', 'Assign tags', 'Start', 'Restart', 'Stop', and 'Delete'. The main section is titled 'Subscriptions: Pase para Azure: patrocinio'. Below this, there are filters for 'Filter by name...', 'All resource groups', 'All locations', 'All tags', and 'No grouping'. A table lists 2 items:

	NAME	STATUS	APP TYPE	APP SER...	LOCATION	SUBSCRI...
<input type="checkbox"/>	 myfirstapp777	Running	Web App	myappdvdp...	Central US	Pase para ...
<input type="checkbox"/>	 mynewapi777	Running	Api app	myappdvdp...	Central US	Pase para ...

2. On the Web App blade, under settings click on Configuration, on the Connection Strings section click on + New connection string



The screenshot shows the Azure App Service Configuration blade for 'myfirstapp889'. The left sidebar contains a list of settings: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Security, Deployment, Quickstart, Deployment slots, Deployment Center, Configuration (highlighted with a red box), Authentication / Authorization, Application Insights, Identity, Backups, Custom domains, TLS/SSL settings, and Networking. The main area is titled 'myfirstapp889 - Configuration'. It has tabs for 'Application settings', 'General settings', 'Default documents', and 'Path mappings'. The 'Application settings' tab is active. Below it, there is a section for 'Application settings' with a note about encryption and a '+ New application setting' button. Below that, there is a section for 'Connection strings' with a note about encryption and a '+ New connection string' button (highlighted with a red box). The table below the 'Connection strings' section is empty.

3. On Connection String Name Type democs, on Value paste the connection string that you obtained on the past task, change the values from username and password with demouser and Password.1!!, On Type, select SQLAzure, then click on update at the bottom of the blade

## Add/Edit connection string

Name	<input type="text" value="democs"/>
Value	<input type="text" value="Server=tcp:sqltest889.database.windows.net,1433;Initial Catalog=AdventureTest;Persist Security Info=False;User ID=demouser;Password=Passwor..."/>
Type	<input type="text" value="SQLAzure"/>
<input type="checkbox"/> deployment slot setting	

<input type="button" value="Update"/>	<input type="button" value="Cancel"/>
---------------------------------------	---------------------------------------

4. NOTE: You can name the connection strings to match with the connection strings you use on your code.
5. On the Configuration Blade, click on Save

Save

Discard

Application settings \*

General settings

Default documents

Path mappings

### Application settings

Application settings are encrypted at rest and transmitted over an encrypted channel. You can choose to display them in plain text in your browser by using the controls below. Application Settings are exposed as environment variables for access by your application at runtime. [Learn more](#)

+ New application setting
 Show values
 Advanced edit
 Filter

Name	Value	deployment...
(no application settings to display)		

### Connection strings

Connection strings are encrypted at rest and transmitted over an encrypted channel.

+ New connection string
 Show values
 Advanced edit
 Filter

Name	Value	Type	deployment...
democs	Hidden value. Click show values button above	SQLAzure	



## Exercise 4: Identity and security

### Task 1: Protect your WebApp with Azure Identity.


1. In the Azure portal, navigate to the Web App you created on the Exercise 3 (Select, App Services in the left menu, and then your app). Under settings, select Authentication / Authorization

The screenshot shows the Azure portal interface for an App Service named 'myfirstapp777'. The left-hand navigation pane is visible, with the 'Authentication / Authorization' option highlighted in red. The main content area displays the 'Deploy to your new site' button and a list of application settings including Resource group, Status, Location, Subscription, and Tags. Below these settings are three informational cards: 'Diagnose and solve problems', 'Application Insights', and 'App Service Advisor'. At the bottom of the page, there are three charts: 'Http 5xx', 'Data In', and 'Data Out'.

2. If Authentication / Authorization is not enabled, select On.

 Save  Discard


### Authentication / Authorization


 Anonymous access is enabled on the App Service app. Users will not be prompted for login.


**App Service Authentication**


Action to take when request is not authenticated


### Authentication Providers

 Azure Active Directory  
Not Configured

 Facebook  
Not Configured

 Google  
Not Configured

 Twitter  
Not Configured

 Microsoft  
Not Configured

### Advanced Settings

Token Store

**ALLOWED EXTERNAL REDIRECT URLS**

3. Under Action to take when request is not authenticated, select Log in with Azure Active Directory.
4. Under Authentication Providers, Select Azure Active Directory, and then select Express under Management Mode.

Home > App Services > myfirstapp777 - Authentication / Authorization > Azure Active Directory

## Azure Active Directory Settings

### Active Directory Authentication

These settings allow users to sign in with Azure Active Directory. Click here to learn more. [Learn more](#)

Management mode Off **Express** Advanced

Express mode allows user to create an AD Application or select an existing AD application in your current Active Directory.

Current Active Directory  
Directorio predeterminado

Management mode Create New AD App Select Existing AD App

\* Create App  
myfirstapp777

Grant Common Data Services Permissions On **Off**

5. Select OK to register the App Service app in Azure Active Directory. This creates a new app registration.
6. Click Save.

You are now ready to use Azure Active Directory for authentication in your App Service app.

## Task 2: Test the protection.

1. From the App Services Blade, click on Overview.
2. Under URL on the dashboard click on the link to test the Authentication you just Enabled.
3. Sign in with the azure account provided for this lab

Note that the web app you just created now is protected with Azure Active Directory Identity

End of the lab